

SYNAPSE, Jaypee University of Information Technology presents

# STOMATA 2.1

The Synapse of Genuine, Elaborative, Naïve and Eloquent minds

## How SMART are our Biotechnologists?

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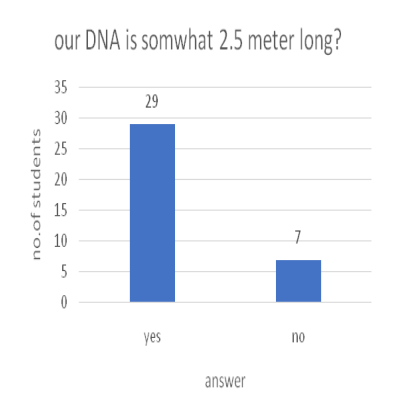
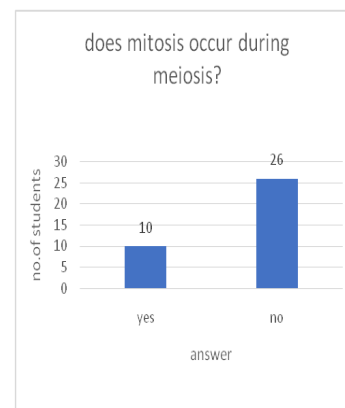
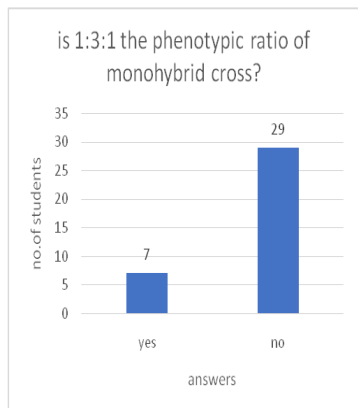
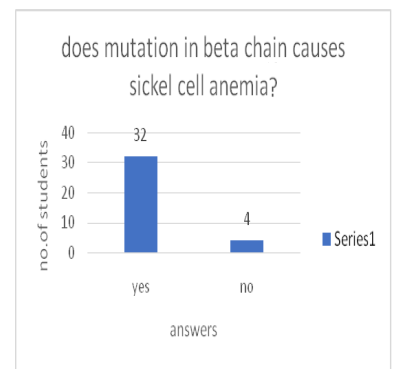
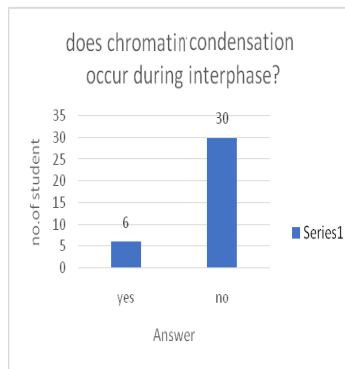
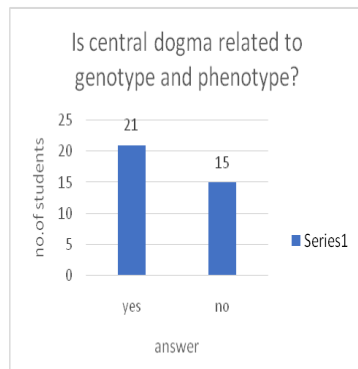
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## NOBEL PRIZE WINNER—2016

A Japanese cell biologist, was awarded the Nobel Prize in Physiology or Medicine on Monday for his discoveries on how cells recycle their content, a process known as autophagy, A Greek term for “self-eating.” It is a crucial process. During starvation, cells break down proteins and nonessential components and reuse them for energy. Cells also use autophagy to destroy invading viruses and bacteria, sending them off

for recycling. And cells use autophagy to get rid of damaged structures. The process is thought to go awry in cancer, infectious diseases, immunological diseases and neurodegenerative disorders. Disruptions in autophagy are also thought to play a role in aging. Studied the process in baker’s yeast.



From the editors :

For our upcoming magazine... Write without fear!  
We'll separate wheat from the chaff and assure that your chaff is printed. Happy writing. Happy Reading!

# INCIPERE

Synapse Club organized “Incipere”- an event conducted, to welcome the students of first year to the Biotechnology and Bioinformatics family of JUIT. The event commenced with a welcome note and Lamp Lighting followed by an addressal by Dr.Saurabh Bansal, Faculty Coordinator of ‘Synapse’. The students were informed of the History of Synapse and a video was shown through which they were introduced to the working of the Club and the events conducted by it in previous years.

A hilarious skit titled ‘*Biotech Baba*’ was then presented by the second year students, which sent everyone, students and faculty alike, into fits of laughter. Also, many were facilitated for their outstanding achievements in various activities organised in and outside the university.

Dr. Rajinder Chauhan, Dean Biotechnology and Head of the Department BT and BI, then formally welcomed the newbies and spoke at length about how ‘Synapse’ has always been integral to our Department.

A soulful instrumental performance by the band ‘Rough sketch’ then enthralled the audience. Vote of Thanks was given by Bishal Prasher, the former president of Synapse Club who explained in essence what it means to be a member of the Club.

The event concluded with an after-movie followed by ‘High Tea which all the students interacted with the first years in an informal session.



On 29<sup>th</sup> September JUIT, Wagnaghat witnessed a volcano of ideas as Department of Biotechnology and Bioinformatics successfully conducted the prestigious public speaking event ‘*voice for BT*’. With the efforts of the Synapse Club, a student body of the department, by 9 AM the stage was set, the audience seated and the participants ready to go. The event started off with lamp lighting and a melodious prayer, followed by a welcome note by Mr. G. S. Krishnan, regional head, Novozymes and an inaugural speech by our very own Vice Chancellor Dr. Vinod Kumar. Mr. Narayanan Suresh, editor-in-chief, BioSpectrum & COO – ABLE (Association of Biotechnology Led Enterprises) was also called upon to explain role of ABLE and its activity in the Biotechnology industry.

The way in which the participants enraptured the crowd was a sight to behold. In all there were 16 participants from northern part of India, but from the very first speaker it was fairly

certain that the lesser number this time around, meant tougher competition. The honourable judges’ chair consisted of: Mr. Narayan Suresh; Mr. Divakar Rao, Advisor, Life Sciences Sector; Mr. Mas Jonwall, Head of Research and Development, Novozymes; and Mr. G.S Krishnan. There were three topics, namely ‘Biofuels’, ‘Food and Nutrition’ and ‘Water Conservation’. All the participants gave wonderful statements on all these topics with complete set of qualitative and quantitative records for the national as well as global scenario.

The participants were judged by the able chair on various criteria such as communication, relevance of content, summary etc and after a thorough evaluation, Mr. Adarsh Raj of Post Graduate Government College, Chandigarh bagged the first prize. There were two runner ups in Ms. Tanmayee Basu of Goswami Ganesh Dutta Sanatan Dharma College, Chandigarh and Ms. Sheya Singh from our very own JUIT! The winner got a cash prize of ₹20,000 and a three-month internship at Novozymes’ facility. The first runner up was given a prize of ₹15,000 and 2 months internship and the second runner up was given

## VOICE FOR BT’16

₹10,000 and a month’s internship at Novozymes. Also, all the participants were given a silver medallion and a certificate of appreciation for their valiant efforts.

Along with the speakers our dignitaries also captivated the audience with their words of wisdom as they talked about their take on the given topics and the role biotechnology can play in changing the world today. Mr. Mas Jonwall and Head of Department Dr. R. S. Chauhan were especially appreciative of the courage, ideas and passion among the participants which was surely going to take them a long way.

This was the third time that ‘*voice for BT*’ was organized in JUIT jointly with Novozymes, BioSpectrum and ABLE. The event ended on a high note as everyone broke for lunch after the students of Synapse presented a satirical skit themed ‘*Bickering Scientists*’ that sent the audience into fits of laughter. This skit was coordinated by Siddhantand Diksha, III year BI students, under the guidance of Dr. Tiratha Raj Singh. Over all the event was beautifully compiled and coordinated by Dr. Saurabh Bansal, through JUIT–BT and BI students,



# INFINITY



The Career team of Synapse Club conducted a bio-based test series titled "Infinity" on November 28 aimed at enhancing the problem solving skills of

the students. With the perspective of familiarizing peers with national competitive exams, the test was modelled after papers from GATE, CSIR NET, DBT and JRF which are the Gateway exams to higher education after Graduation. As many as 44 students from all years appeared for the test and bagged ranks on the basis of their score. The average and the maximum score

was 10.15 and 19 respectively. Motivated by the positive response "Infinity" received, the team plans to conduct these tests fortnightly and might even introduce another test series for CAT aspirants.



# WEBINAR

With that in perspective, on 19<sup>th</sup> November 2016 the Alumni Affair committee of Synapse organized an online interaction session called "WEBINAR" for the second time, with one of our distinguished alumni, Miss Shivai Gupta.

'Webinar' is all about interacting with the alumni, asking about their experiences, new opportunities, primarily related to biotechnology and bioinformatics and how things can be explored in near future in various avenues in these areas. Students of the department showed up for the session making it quite a success but the presence of our respected faculties Dr. Saurabh Bansal and Dr. Hemant Sood further added four stars to

the interactive event, conducted between 11:00a.m and 12:00p.m. Miss Shivai, is a beloved senior who graduated with her Bachelors in Biotechnology from JUIT last year. She went on to do her masters in the same field from Georgetown University, Washington, D.C., U.S.A with a certification in Bio-Business. Currently she is working for the prestigious, U.S. Food and Drug Administration (FDA).

Some of the noteworthy questions asked her were: What is Bio-Business? How can we apply for MS in USA? Is there any scope of MBA in biotechnology? What are her future plans? Our faculties also asked her to shed

some light on the atmosphere for studies abroad.

Not surprisingly, she answered all the questions in a very articulate and satisfying manner. When asked about her future plans she said "I am preparing to give GRE once again and then I would apply for PhD programs". In totality, the essence of the event to gain knowledge on future prospective abroad and the technicalities involved was retained till the very end, all credit to the interactive audience and the able speaker!

"Education is the passport to the future, for tomorrow belongs to those who prepare for it today." - MALCOLM X

# BIOMODELLING

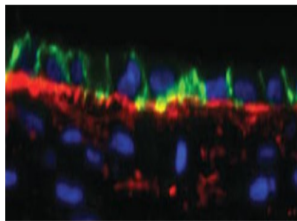
Inquisitiveness galore through the halls of JUIT on 26 November 2016 as students displayed their Bio - models at the Biomodelling contest organized by Synapse club. The 16 participating teams were given a span of 1 month to create their bio based models and displayed an amalgam of creativi-

ty and unconventional thinking. The teams were judged on presentation skills, concept, technicality, aesthetic appeal, application of inter-branch knowledge and creativity. Mrs. Poonam Sharma, Mrs. Meenakshi and Mr. Jatashankar were part of the judging team. Akash Luthra bagged first prize and the runner ups were Aakriti and Suchita, while Harshita and Shubhangi went on to win the third position. Winners were awarded with certificates and discount coupons, with this the exuberant and enlightening competition reached its conclusion

# WHAT'S TRENDING ?

## Organovo >> ExVive Human Kidney Tissue

A crucial stage of drug development is testing whether a candidate compound damages the kidneys, but existing cell cultures and animal models can only approximate the human kidney. ExVive Human Kidney Tissue from Organovo is a replica of the kidney proximal tube created using 3-D bioprinting. It offers drug developers a reliable means of testing for renal toxicity. Currently, few preclinical tests can determine whether a potential drug is toxic in humans, making investing in clinical testing risky for developers. Identifying renal toxicity early on reduces that risk. More importantly, "you're really talking about doing no harm to the patients that are going to be in the clinical trial," says Organovo Chief Scientific Officer Sharon Presnell. Bioprinting operates on a similar principle to 3-D plastic printing, explains Presnell, but



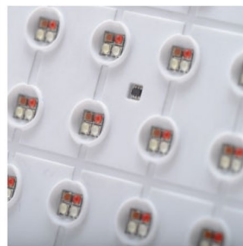
"instead of putting beads of polymer into a printer, we're putting little aggregates of cells." Organovo, which won a spot in 2014's Top 10 Innovations for its ExVive Liver Tissue, produces tissue samples on a contract basis, and pricing can vary widely depending on the number and type of samples a client requires. The replica kidney tissue could be applied outside of toxicology too, as a platform for experiments on kidney tissue that would not be otherwise feasible, Presnell says. "It seems to have integrity like a native kidney tissue," says Caroline Lee, a metabolism and pharmacokinetics researcher at Ardea Biosciences who profiled transport protein expression in the artificial tissue. Lee found that directional transport proteins were oriented correctly along the membrane. "You can see drugs going in the right direction," she says. "It's pretty remarkable."

## AxionBioSystems >> Lumos

**AxionBioSystems makes in vitro optogenetics more precise and more**

replicable than ever, thanks to its new Lumos light-delivery system, first shipped in December 2015. The apparatus contains 48 wells, each with four individually controllable LEDs that can flash different wavelengths of light—blue, green, orange, and red—with microsecond precision. When positioned above a microarray culture plate with a recorder fixed beneath, the setup allows researchers the ability to precisely stimulate, manipulate, and measure a variety of cultured cells.

Geneticist David Goldstein is poised to use the Lumos in his Columbia University lab to study the behavior of cultured human neuronal networks with mutations that cause different forms of epilepsy. "What we've been looking for for a long time now, in a precision medicine context for epilepsy, is a medium-complexity in vitro model . . . but [one that is] still high-throughput enough so we can screen compounds," he says. Cultured neuronal networks tend to synchronize their synaptic firing, decreasing the amount of information that experimentalists can extract from their behavior. "To elicit more complex behavior that might reveal the effects of the mutations, what we want to be able to do is kind of tune activity in the networks while we're monitoring the response," Goldstein says, adding that he expects data from the Lumos to come in over the next year. "That's exactly what this system allows us to do."



**The Lumos costs US\$26,000.**

## Photometrics >> Prime sCMOS Camera

The modern microscopes, researchers turn to high-powered cameras to help them capture images of what's in their sample. "Every year, these cameras have gotten better and better and better," says Rachit Mohindra, product manager at Photometrics, a company that specializes in microscopy cameras and other imaging systems for life science research. "They're basically perfect." To improve on perfection is tough, he admits, but he thinks he and his colleagues have done just that with their 4.2 megapixel Prime sCMOS camera. Released at the beginning of 2016, the camera has a built-in algorithm to reduce shot noise—the variation inherent in measurements taken using light microscopes—without having to acquire many extra images and then average across them, or increase the light intensity, which can damage samples. "You're able to maintain your low levels of light, keep [target cells] alive for longer, and get nice data," Mohindra says. The Prime camera improves signal-to-noise ratio three to five times, he adds, which is "equivalent of being able to turn down the light by a factor of 10." The Prime sCMOS camera's built-in algorithm also reduces the total amount of data collected by a researcher, hastening processing and analysis times. "It takes about 30 seconds per frame to process if you do it offline," Mohindra says. "When you have a camera that acquires at 100 frames per second, that's 5 minutes for 1 second's worth of data." But with the Prime camera, he says, researchers can process the data immediately. "The real-time filtering and high frame rates of the Photometrics Prime sCMOS camera enable us to capture even more super-resolution microscopy data and to better characterize variability in the structure of chromatin," Kyle Douglass of École Polytechnique Fédérale de Lausanne in Switzerland noted on the company's website. The Prime sCMOS camera costs US\$15,950.

**If it doesn't  
challenge you,  
it won't  
change you.**

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